

Model 5392

Dual Chamber External Pacemaker

Reference guide



Medtronic

PRE-USE	What to do ...	What NOT to do ...
Battery	Replace the battery for each new patient.	Do NOT reuse battery.
Physical condition*	Check case for cracks/damage.* Check battery drawer for closure.* Check display for cracks/damage.*	Do NOT ignore visible physical damage; the device may appear to work properly immediately after being dropped or mishandled, but operational damage may have occurred.
Cables	Inspect cables and leads for possible defects, and secure connection before each use.	Do NOT use damaged leads or cables. Improper connection, displacement, or fracture may result in pacemaker failure. Do NOT reuse single-use cables.
IN USE		
Placement	Do not place the temporary pacemaker in any area outside of the direct observation by medical staff. If necessary, insert into a Disposable Pouch† (see-through plastic pocket) with an attachment panel (to hang from IV pole) that protects and holds the temporary pacemaker. Place the temporary pacemaker in an area that minimizes access to the controls by unauthorized personnel, such as patients and visitors.	Do NOT place the device in any area where the patient may interact with it.
POST-USE		
Clean	External surfaces of unit can be cleaned using a sponge or cloth moistened with water or 70% isopropyl alcohol. For internal surfaces, send to Medtronic for cleaning, safety, and technical check.	Do NOT attempt to clean any internal surfaces, including battery compartment. Do NOT immerse the device in water or cleaning agents; do NOT expose the unit to ethers, acetone, or chlorinated solvents.
If dropped/ Visible exterior damage	Send to Medtronic for safety and technical check.	Do NOT ignore; the device may appear to work appropriately immediately after being dropped or mishandled, but operational damage may have occurred.
If spilled on	Send to Medtronic for safety, and technical check.	Do NOT ignore; the temporary pacemaker was designed to minimize leakage, but fluid incursion may still occur.

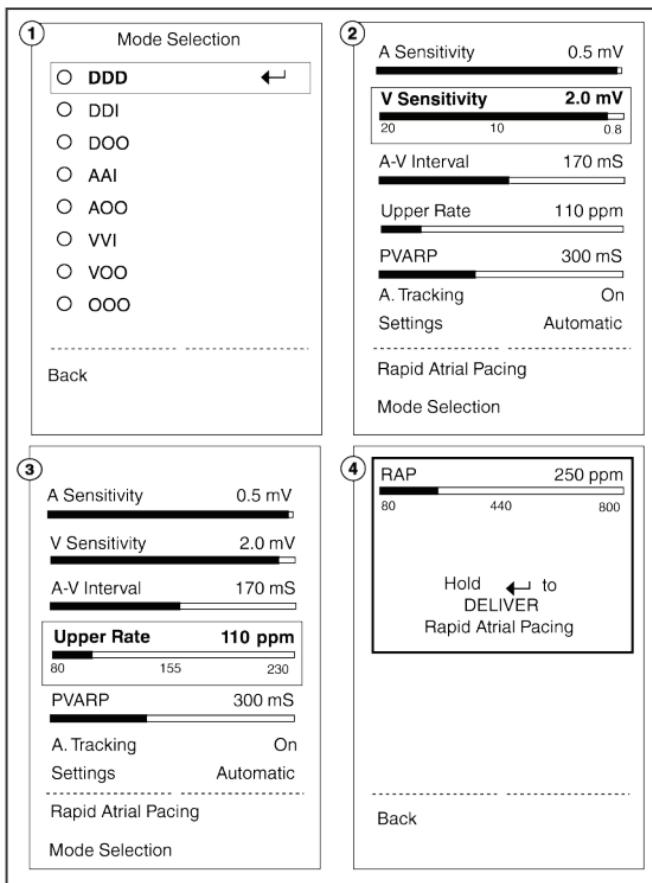
*Should service or repair be necessary, contact your local Medtronic representative.

†Disposable Pouch available for the Model 15392 Temporary Pacemaker; Model #5409.

Safety and technical checks should be carried out at least once every 12 months and after any malfunction or accident. Visit MedtronicConnect.com or call 1-800-638-1191 to inquire further about the Medtronic Annual Test and Calibration Program. Additional use and training information available at MedtronicConnect.com.

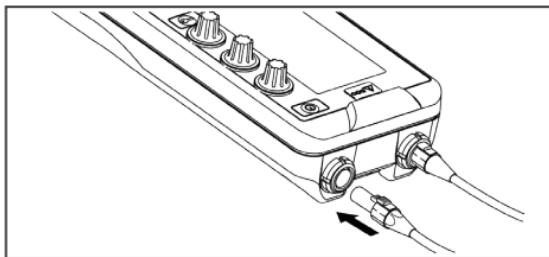
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Basic operation – lower screen pacing parameters for DDD mode.



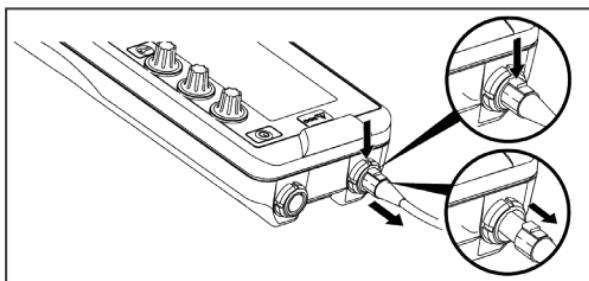
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Basic operation



Connector Setup

1. Verify that the temporary pacemaker is turned off.
2. Plug the Model 5492AL and Model 5492VL patient cables or another pair of Medtronic compatible cables into appropriate sockets on the connector block on top of the temporary pacemaker. One socket is marked A (atrium); the other is marked V (ventricle).
3. Verify that each patient cable clicks when it is inserted into the temporary pacemaker connector receptacle.
Note: The audible click verifies that the plug is completely inserted into the receptacle.
4. Pull gently on the patient cables after insertion to ensure a good connection.
5. Connect the leads to the appropriate cable. Match positive (+) and negative (-) leads to positive (+) and negative (-) sockets or clips for the atrium and ventricle (not shown). The sockets are also color-coded blue for atrium and white for ventricle.



Note: To disconnect the patient cables from the temporary pacemaker, do the following:

1. Press the connector release button on the patient cable plug.
2. Gently pull the plug from the receptacle.

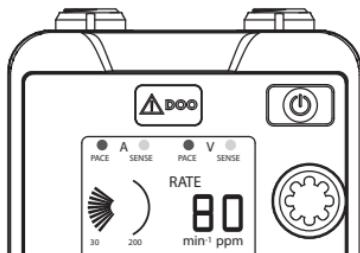
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Basic operation

To Turn On

Press and hold the ON/OFF key momentarily to turn on the temporary pacemaker.

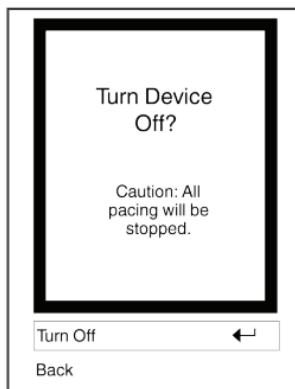
The upper screen and the backlight illuminate, a self-test is initiated, and the temporary pacemaker first paces, and then begins sensing and pacing in both chambers (DDD mode).



Note: Pressing a key while the self-test is in process can cause the device to fail the self-test, and display error code "0004." The device may interpret the pressed key as being "stuck" and, therefore, malfunctioning. If a key is pressed during the self-test, remove and reinsert the battery to clear the error code.

To Turn Off

1. Unlock the temporary pacemaker, if it is locked (see following section).
2. Press the ON/OFF key once. A message is displayed in the lower screen to confirm temporary pacemaker shutdown (see Figure below).



3. Press the ENTER key once to confirm temporary pacemaker shutdown.

Basic operation

Lock/Unlock

The LOCK/UNLOCK key locks the temporary pacemaker to prevent inadvertent adjustment of the parameters, or unlocks the temporary pacemaker when it is locked.

When Locked

- The Rate, A Output and V Output parameter values lock and cannot be adjusted.
- Pacing therapy continues to be delivered at the currently selected values.
- The Lock indicator appears in the status bar.
- The lower screen does not appear. The Mode Selection options and pacing parameters cannot be adjusted.
- The PAUSE key is locked.
- Press LOCK/UNLOCK key to unlock the 5392 before adjusting parameters.
- Press LOCK/UNLOCK key to lock the 5392 after adjusting parameters.

Notes:

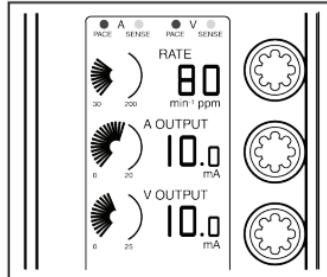
- The DOO/EMERGENCY key does not lock. If pressed while the temporary pacemaker is locked, the temporary pacemaker begins asynchronous pacing.
- The temporary pacemaker locks under one of the following conditions:
 - 60 s after the last parameter adjustment is made
 - When the LOCK/UNLOCK key is pressed

If any parameter dials are adjusted or any keys are pressed while the temporary pacemaker is locked (other than the DOO/EMERGENCY key), the Lock indicator flashes, and the lower screen displays the Locked message for approximately 30 s.

Basic operation

Rate and Output Adjustments

1. If the Lock indicator appears in the status bar, press LOCK/UNLOCK key.
2. To adjust RATE, A (Atrial) OUTPUT, or v (Ventricular) OUTPUT, turn the dials clockwise to increase their values; turn the dials counterclockwise to decrease their values, or to set the outputs to off.



Rate and output values appear on upper screen.

Viewing Patient's Intrinsic Rhythm

- Reduce the RATE gradually, while watching the ECG, until the patient's intrinsic rhythm takes over.
- Press and hold PAUSE key to suspend pacing and sensing up to 10 seconds.

Note: To pause again up to 10 seconds, release PAUSE key; then press and hold the PAUSE key again.

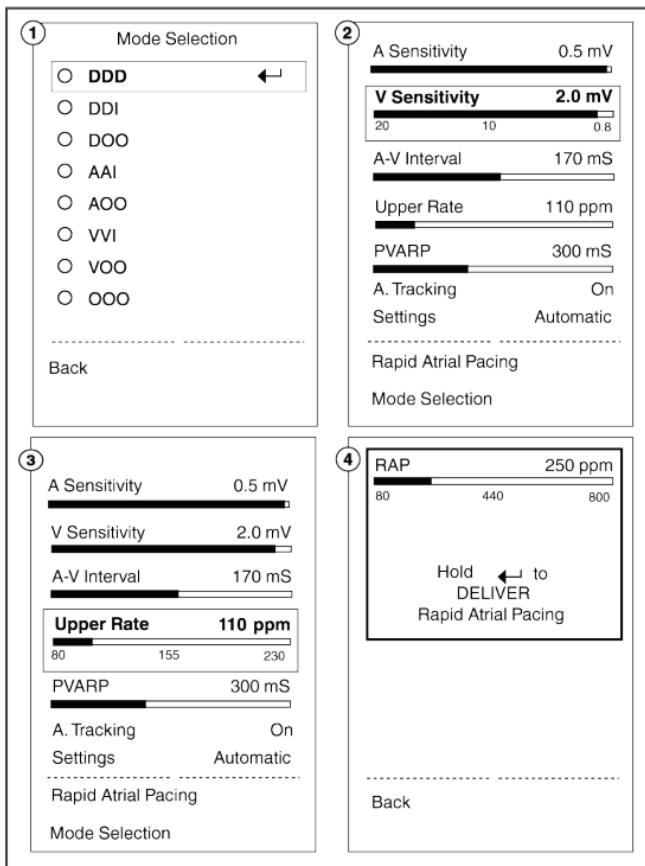
EMERGENCY Pacing

Press DOO/EMERGENCY key to initiate high-output, dual chamber asynchronous pacing (DOO for emergency).

Note: Press the ENTER key to return to synchronous (demand) pacing, or select the modes with synchronized pacing from the Mode Selection menu and adjust A Sensitivity and/or V Sensitivity.

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Lower screen pacing parameter adjustments



After a pacing mode has been selected, the Pacing Parameters menu for that pacing mode is displayed and the parameters can be adjusted.

Screen 1: Mode Selection screen

Screen 2: V Sensitivity selected on the DDD pacing parameters screen

Screen 3: Upper Rate selected on the DDD pacing parameters screen

Screen 4: RAP screen

Note: Parameters displayed on menus are based on currently programmed pacing mode and rate. Parameters that do not apply to the current chambers being paced and sensed are not displayed. Parameters that did not apply in the previous mode are set to nominal values in the new mode.

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Lower screen pacing parameter adjustments

To Adjust Atrial/Ventricular Sensitivity

1. Press MENU key until Menu 1 is displayed.
2. Press SELECT key until A Sensitivity or V Sensitivity is highlighted.
3. Turn MENU PARAMETER dial clockwise to increase sensitivity; counterclockwise to decrease sensitivity, or set to ASYNC.
 - A Sensitivity range: 0.4 mV - 10 mV and ASYNC
 - V Sensitivity range: 0.8 mV - 20 mV and ASYNC

Notes:

- Setting A Sensitivity or V Sensitivity to ASYNC turns sensing off and starts asynchronous pacing.
- The highest number (in mV) for Sensitivity is the least sensitive setting; the lowest number (in mV) is the most sensitive setting.

To Turn Atrial Tracking Off or On

(Set to DDI or DDD mode)

1. Press MENU key until Menu 1 is displayed.
2. Press SELECT key until A Tracking is highlighted.
3. Turn MENU PARAMETER dial counterclockwise to display OFF (DDI mode); clockwise to display ON (DDD mode).

Note: Atrial tracking can be set to OFF only from DDD mode and set to ON only from DDI mode.

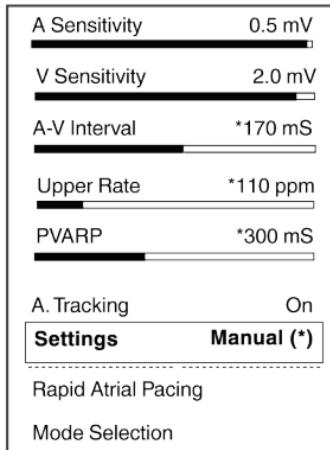
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Lower screen pacing parameter adjustments

Rate-Dependent Parameters

Upper Rate, PVARP, and A-V Interval are *automatically* set whenever rate is adjusted, but can be *manually* adjusted from lower screens.

Note: An asterisk (*) is shown next to the value of each setting that is manually adjusted.



To Adjust A-V Interval

1. Navigate to the Pacing Parameters menu.
2. Press the UP or DOWN ARROW key to highlight A-V Interval.
3. Turn the MENU PARAMETER dial clockwise to lengthen the A-V Interval, or counterclockwise to shorten the A-V Interval.
Range: 20 ms - 300 ms

To Adjust Upper Rate

1. Navigate to the Pacing Parameters menu.
2. Press the UP or DOWN ARROW key to highlight Upper Rate.
3. Turn the MENU PARAMETER dial clockwise to increase the upper rate, or counterclockwise to decrease the upper rate. The Upper Rate parameter is only adjustable in DDD mode.
Range: 80 ppm - 230 ppm

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Lower screen pacing parameter adjustments

To Adjust PVARP

1. Navigate to the PACING PARAMETERS menu.
2. Press the UP or DOWN ARROW key to select PVARP.
3. Turn the MENU PARAMETER dial clockwise to increase the PVARP, or counterclockwise to decrease the PVARP.

Range: 150 ms - 500 ms

To Reset Rate-Dependent Values to Automatic Settings

1. Navigate to the PACING PARAMETERS menu.
2. Select **Settings**.
3. Turn the MENU PARAMETER dial either clockwise or counterclockwise until **Automatic** replaces **Manual**.
4. Use the MENU PARAMETER dial to alternate between Automatic and Manual parameter settings, as long as **Settings** remains selected.

*Previous **Manual** settings are lost when **Automatic** is selected for Upper Rate, PVARP and A-V Interval.*

Sensing thresholds

Note: The sensing threshold is the least sensitive setting at which the pacemaker can detect a heartbeat. To find the atrial and ventricular thresholds, monitor the patient's ECG as you follow the procedure below.

Caution: Pacemaker-dependent patients will have limited or no intrinsic rate/rhythm.

To Find Atrial or Ventricular Sensing Threshold

1. Turn on the temporary pacemaker without connecting it to the patient lead system.

Caution: Do not connect the temporary pacemaker to the patient lead system until step 4.

2. Set **Rate** to at least 10 ppm under the patient's intrinsic rate. This adjustment ensures non-pacing.

3. Adjust the atrial or ventricular output to prevent the risk of competitive pacing.

- **Atrial:** Set **A Output** to 0.1 mA
- **Ventricular:** Set **V Output** to 0.1 mA

4. Connect the temporary pacemaker to the patient lead system.

5. Navigate to the **MODE SELECTION** menu and select the appropriate pacing mode for the patient leads that are connected to the patient.

- Select DDD mode if both channels are connected.
- Select AAI mode if only the atrial channel is connected.
- Select VVI mode if only the ventricular channel is connected.

6. Navigate to the **Sensitivity** settings.

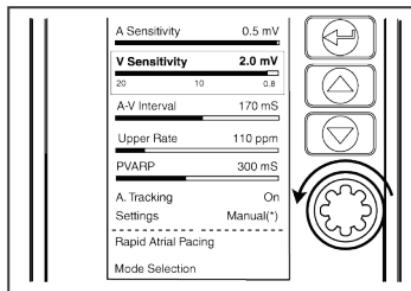
- a. Complete steps 7 thru 9 for the **A Sensitivity** setting, if the atrial channel is connected.
- b. Complete steps 7 thru 9 for the **V Sensitivity** setting, if the ventricular channel is connected.

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Sensing thresholds

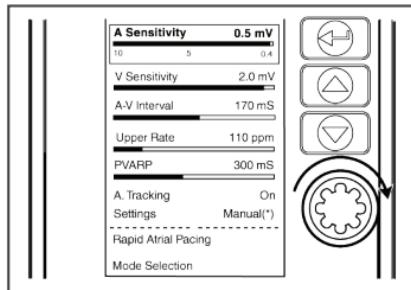
7. Decrease Sensitivity: Slowly turn the MENU PARAMETER dial counterclockwise (increase mV value) until the sense indicator stops flashing.

The pace indicator flashes continuously, but capture is not likely because the output value is set to minimum.



8. Increase Sensitivity: Slowly turn the MENU PARAMETER dial clockwise (decrease mV value) until the sense indicator starts flashing.

- The pace indicator stops flashing.
- This value is the sensing threshold.



9. Set Sensitivity to half (or less) the threshold value. This setting provides at least a 2:1 safety margin.

10. Restore Rate, A Output, or V Output to previous values.

Stimulation thresholds

Note: The stimulation threshold is the minimum output pulse needed to consistently capture the heart. To find this threshold, monitor the ECG as you follow the procedure below. To reduce the risk of competitive pacing, find the sensing threshold first (if the patient's intrinsic rate is adequate).

To Find Atrial or Ventricular Stimulation Threshold

1. Verify that the patient is connected to the temporary pacemaker and is being monitored on the ECG.
2. Set **Rate** at least 10 ppm above the patient's intrinsic rate.

This adjustment ensures pacing. The pace indicator flashes.

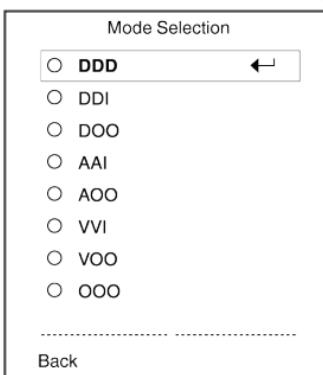
3. Decrease **Output**: Slowly turn the **OUTPUT** dial counterclockwise until ECG shows loss of capture. Pace and sense indicators flash intermittently.
4. Increase **Output**: Slowly turn the **OUTPUT** dial clockwise until ECG shows consistent capture.
 - The pace indicator flashes continuously; the sense indicator stops flashing.
 - This value is the stimulation threshold.
5. Set **Output** to a value at least 2 to 3 times greater than the stimulation threshold value. This setting provides at least a 2:1 safety margin.
6. Restore **Rate** to the previous value.

Pacing setup

Notes:

- The Pacing Setup Table on the other side of this card provides a reference to output and sensitivity settings for each available pacing mode.
 1. Verify Output.
 2. Verify Sensitivity.
 3. Verify Atrial Tracking.
 4. Verify Pacing Setup Indicators.
- The Pacing Parameter Adjustments card describes how to manually adjust pacing parameters.

To Dial-A-Mode (DDD, DDI, DOO, AAI, AOO, VVI or VOO pacing modes, or OOO for no pacing therapy)



1. Navigate to the MODE SELECTION menu.
2. Press the UP or DOWN ARROW keys to highlight a pacing mode.
3. Press the ENTER key to select the pacing mode.

Pacing in the selected mode begins as follows:

Rate, Output, and Sensitivity values are set to the nominal values when a pacing mode is selected, unless they have been manually adjusted before the pacing mode was selected. If they have been manually adjusted before the pacing mode was selected, the new pacing mode retains these values.

Note: Manually-set pacing parameter values are not retained when the temporary pacemaker is turned off, and then turned back on.

Temporary external pacemaker 5392 setup table

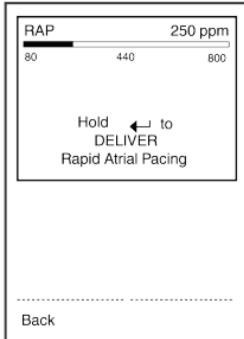
	AOO	VOO	AAI	VI	DOO	DDD	DDI
Setup indicators	[PACE SENSE]						
	[A]	[V]	[A]	[V]	[A+V]	[A+V]	[A+V]
Instructions							
1. Set output							
A Output	On	Off	On	Off	On	On	On
V Output	Off	On	Off	On	On	On	On
2. Set sensitivity							
A Sensitivity	ASYNC	NA	On	NA	ASYNC	On	On
V Sensitivity	NA	ASYNC	NA	On	ASYNC	On	On
3. Set							
A Tracking	NA	NA	NA	NA	On	Off	

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RAP (Rapid Atrial Pacing)

RAP can be used to interrupt some types of atrial tachycardias or to induce an atrial tachycardia.

Caution: RAP is for atrial use only. Be sure that the atrial leads are connected to the atrium, *not the ventricle*, before enabling RAP.



Caution: RAP may result in tachycardia, acceleration of existing tachycardia, or fibrillation. Apply high rates under careful patient monitoring and control. Monitor the patient's ECG and blood pressure, and ensure that defibrillation equipment is immediately available.

To Deliver RAP:

1. Navigate to the PACING PARAMETERS menu.
2. Press the UP or DOWN ARROW key to highlight **Rapid Atrial Pacing (RAP)**.
3. Verify that the leads are in contact with the atrium and are connected to the atrial channel of the temporary pacemaker through a patient or surgical cable.
4. Press the ENTER key to open the RAP screen. The RAP screen displays the RAP rate [initially the rate of 250 ppm]. Pacing continues at currently displayed settings.
5. Adjust RAP rate as needed. Turn the MENU PARAMETER dial clockwise to increase rate, or counterclockwise to decrease rate.

Note: The range for RAP is 80 ppm to 800 ppm.

6. Press and hold the ENTER key to deliver RAP burst. AOO pacing begins at displayed RAP rate and current **A Output**. The **A Pace** LED flashes during delivery of RAP pulses.

Note: RAP delivery stops when either the ENTER key is released, or after 2 minutes have passed.

To exit the RAP screen, use the UP or DOWN ARROW key to select BACK, and then press the ENTER key.

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RAP (Rapid Atrial Pacing)

Adjusting Rate or Atrial Output during RAP Delivery

The RAP rate and A Output can be adjusted during RAP delivery by turning the MENU PARAMETER dial. To adjust A Output, do the following:

1. Continue to press and hold the ENTER key.
2. Turn the MENU PARAMETER dial clockwise or counterclockwise to adjust RAP rate.
3. Turn the A OUTPUT dial clockwise or counterclockwise to adjust atrial output.

Resuming Pacing at Previous Settings

Release ENTER key to resume pacing at the previous settings. The temporary pacemaker stops delivering RAP and resumes operation at the non-RAP settings, within 3 seconds.

If the A Output is adjusted during RAP, the new setting is retained when RAP is terminated.

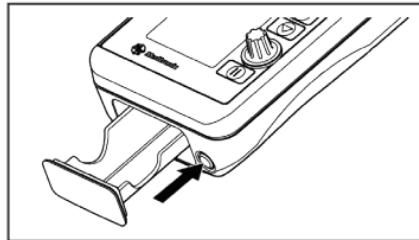
Caution: If the temporary pacemaker continues to deliver RAP after the ENTER key is released, press the ON/OFF key or the DOO/EMERGENCY key to stop RAP. If RAP continues to be delivered, remove the batteries from the temporary pacemaker. Return the temporary pacemaker for service.

Battery replacement

Battery Installation and Replacement

Note: Medtronic recommends disconnecting device from patient before replacing battery.

1. Press the battery drawer latch release button until the battery drawer opens.



2. Remove the old batteries.

3. Install two new LR6-sized (AA-sized) alkaline batteries.

Verify that the batteries align with the polarity markings on the inside of the battery drawer.



4. Close the battery drawer firmly until the battery drawer is fully latched.

Note: Failure to close the battery drawer completely can result in the battery drawer opening and the temporary pacemaker shutting down.

5. Discard the old batteries properly according to local regulations.

Notes:

- Replace the temporary pacemaker batteries in the following situations:
 - Replace the batteries for each new patient.
 - Replace the batteries when the low battery indicator appears during temporary pacemaker operation.
 - Replace the batteries at least once every week when the temporary pacemaker is in continuous use.
- Install the batteries with proper polarity. The temporary pacemaker does not turn on or provide pacing therapy with incorrect battery polarity.
- If during an emergency situation the batteries must be replaced while the temporary pacemaker is in use, ensure that the temporary pacemaker is locked before replacing the batteries. Pacing is maintained at the current settings for 30 seconds, minimum, if the settings are at nominal values.

General Indication statements:

For a listing of indications, contraindications, precautions, warnings, and potential adverse events, please refer to the Instructions for Use. Consult instructions for use on this website <http://manuals.medtronic.com/manuals/main/region>. Manuals can be viewed using a current version of any major Internet browser. For best results, use Adobe Acrobat Reader® with the browser.



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